

Idaho Infrastructure Task Force

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Outline

- Task Force Charter & Members
- Roadmap Update
- INEEL and ANL-W
- Facilities Assessment
- Staffing and Management
- Laboratories & University Interfaces
- Additional Topics for Review
- Most Important Conclusions
- Most Important Recommendations

Task Force Charter-1

- Update the ***Nuclear Science and Technology Infrastructure Roadmap*** and review the specific issues at INEEL, including ANL-W
- Advise concerning the maintenance, upgrade and new construction needs of DOE laboratory infrastructures.

Task Force Charter-2

- Assess the current state of the facilities at INEEL and ANL-West and analyze the infrastructure gaps that could prevent DOE from conducting R&D in key nuclear technology areas over the next decade.
- Consider availability of facilities and capabilities elsewhere when making final recommendations.

Task Force Members

- Robert L. Long, Nuclear Stewardship, LLC, Chair
- Michael L. Corradini, University of Wisconsin-Madison
- Jose L. M. Cortez, University of Texas Pan American
- Warren F. Miller, Jr., Los Alamos National Laboratory
- Allen L. Sessoms, Delaware State University

ITF Review Process

- Task Force appointed 1 Oct 02
- Report requested by end of CY 2002
- Review of documents began immediately
- INEEL and ANL-W visited 6-8 Nov 02
- TF met in Albuquerque 7-8 Jan 03 to complete review and prepare report
- Report submitted 16 Jan 03

Roadmap Update

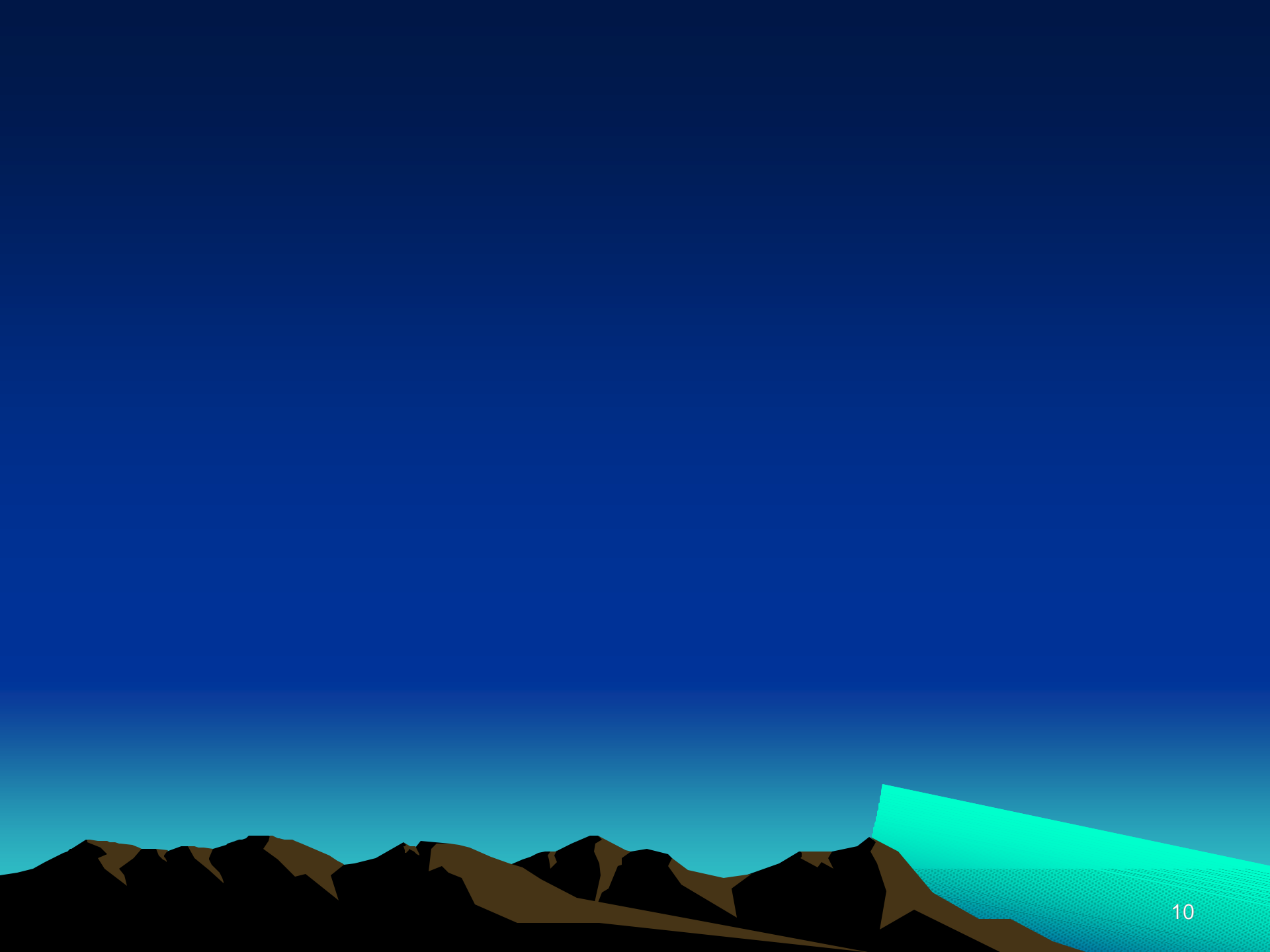
- The first draft of the ***Nuclear Science and Technology Infrastructure Roadmap*** was completed in Dec 98 and revised in Mar 2000
- Task Force members and staff of DOE HQ, INEEL and ANL-W reviewed the ***Roadmap*** and generated substantial new information for inclusion in next revision of the ***Roadmap***

Roadmap Revisions Needed

- Information generated during ITF process
 - New INEEL and ANL-W facility descriptions
 - Assessments of programmatic needs and likely facilities to meet those needs
 - ITF analyses of staffing requirements
- Broader revision should be undertaken
 - Include numerous changes to DOE facilities and missions that have occurred over past 3-4 years

INEEL and ANL-W

- INEEL consists of eight major facility areas scattered across an 890 square-mile area, about 35 miles west of Idaho Falls, ID
- A ninth INEEL area includes offices and several laboratories in Idaho Falls
- ANL-W located on 800-acre tract within INEEL



INEEL



Naval Reactor Facility



Test Reactor Area



Idaho Nuclear Technology and Engineering Center



Radioactive Waste Management Complex



Central Facility Area



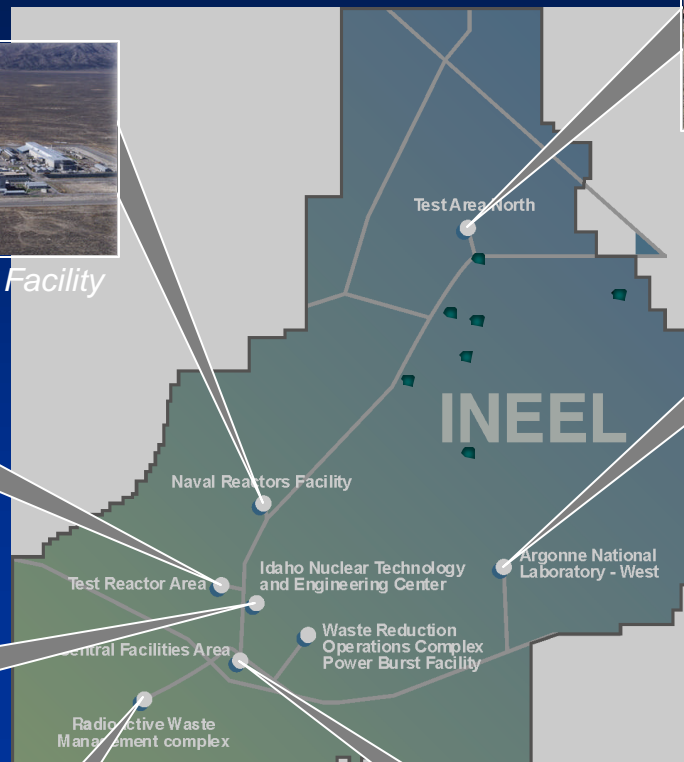
Test Area North

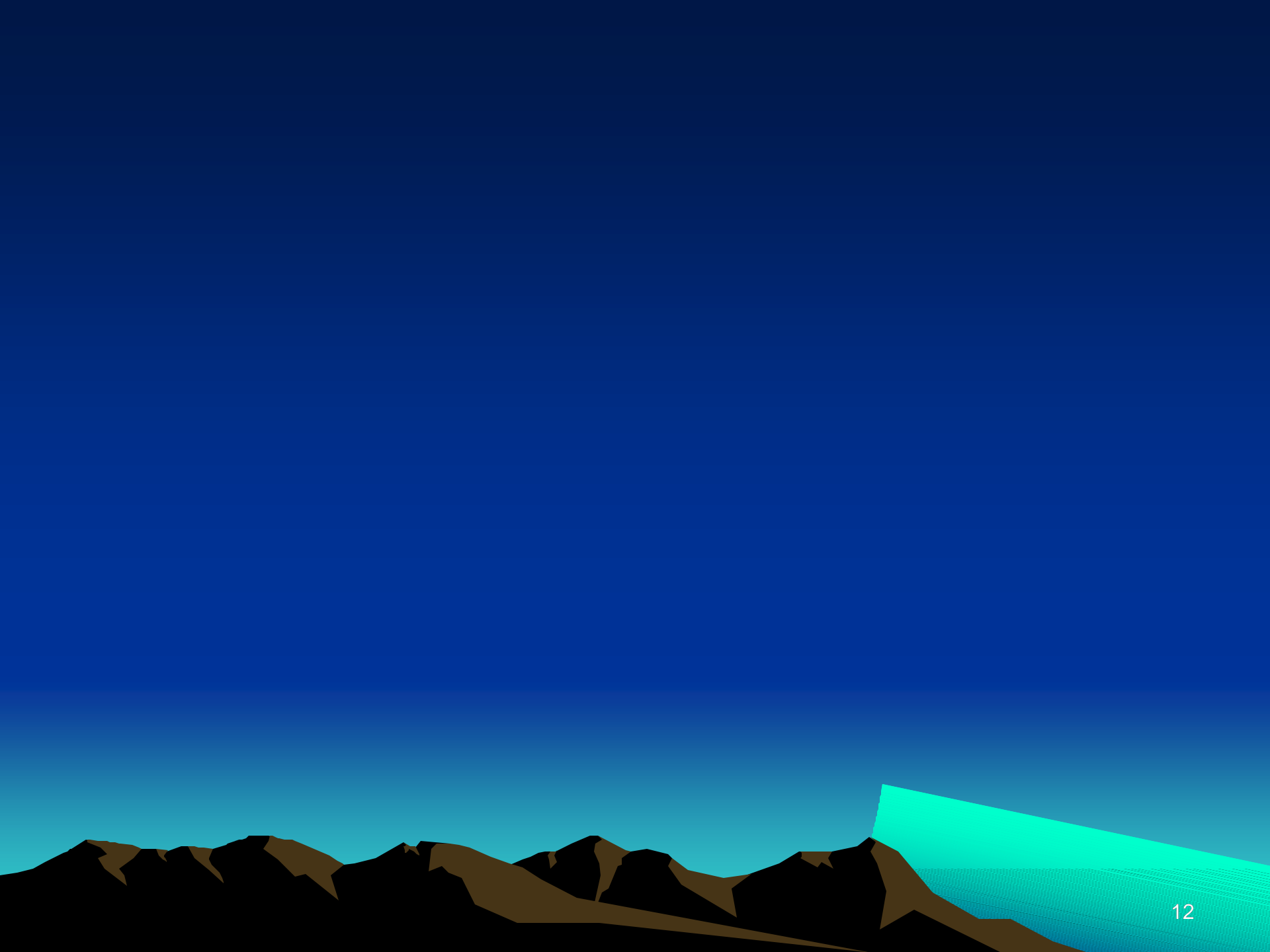


Argonne National Laboratory - West



Engineering Research Office Bldg. and Willowcreek Bldg.





Facilities Assessment

Maintenance Backlog

- Major programmatic facilities well maintained and expected to last 15 years or more
- General purpose facilities are in workable state of repair
- However, important experimental facilities have backlog of needed repairs estimated to cost \$9.3 M at ANL-W and \$10.8M at INEEL
- An additional several \$Million needed to address balance of plant facilities deficiencies

General Purpose Program Funding

- GPP funding for past decade was well below requested levels
- Additional ~\$10M needed annually for normal maintenance and repair and compliance with environmental and safety requirements

Equipment Upgrades

- Much of the equipment used at the two laboratories is in need of replacement and/or upgrading
- Details are mission and facility specific but reasonable estimate is ~\$50M
- Without such an expenditure it is unlikely that new missions will be successfully accomplished or that these laboratories will be able to maintain positions as national leaders in nuclear energy research

Mission Readiness

- A category of readiness that requires full staffing and equipment for the expanded tasks required of the facilities
- Few facilities at either lab are fully “mission ready”
- Resource requirements to have all major facilities at both labs mission ready need to be determined
- Likely to be tens of \$M annually

Comments on a Few Specific Facilities

Advanced Test Reactor (ATR)

- ATR is well staffed and in very good operating condition
- Presently used and funded by Office of Naval Reactors and other smaller customers
- Naval Reactors willing to cost share with NE but scheduling appears to be significant challenge

ATR Support of NE GEN-IV Programs

- Supercritical Water Reactor System
- Gas Fast Reactor System
- Lead-Cooled Fast Reactor System
- Very High Temperature Reactor System
- Advanced Fuel Cycle Initiative, Series I and II
- Nuclear Space Initiative

Possible ATR Modifications

- Design and deployment of a supercritical-water loop for super critical water reactor materials testing would require more than \$10 million dollars and 3 to 4 years to construct
- Building a fast flux booster around one of the flux trap locations estimated to cost in the \$10 million range and could be done in about 3 years.

Possible ATR Limitations

- May not be able to simulate all the conditions called for in the proposed NE programs
- To what extent can the facility be modified to simulate high temperature and high neutron flux conditions needed to study new fuel materials, etc.?
- Determination will require better definition of the extent and scope of GEN-IV programs

Fuel Processing Facility (FPF)

- FPF is a second-generation nuclear fuel processing facility that was built for this purpose but never completed
- Not useful unless several hundred \$M spent to install basic services such as electrical, heating and ventilation, control rooms and the basic fuel processing equipment

FPF Disposition

- A study to determine the modifications needed to perform a new mission will cost hundreds of \$M, including costs of safety analyses and NEPA requirements
- The ITF recommends that any study or plans to complete and open the FPF be abandoned

Proposed INEEL Consolidated Laboratory Support Facility

- INEEL is proposing consolidation of the many facilities now available to undertake new advanced reactor NE programs
- Some are scattered all over the Idaho desert and are in various stages of readiness
- Updated Roadmap is to identify the INEEL facilities to be considered for consolidation

Considerations of Consolidated Facility

- A high quality work environment will attract new personnel needed to undertake new NE missions
- High risk functions out in the desert involving the handling of irradiated nuclear materials could be consolidated
- Lower risk activities would move to town (Idaho Falls) to reduce operating costs.

ITF View of Consolidated Facility

- Consolidation could yield long run benefits
- With limited funds, consolidation should be second in priority
- Program funds should be used for program development, e.g., a new transient test facility
- Once the NE technical mission is better defined, a consolidated facilities plan should be developed

INEEL & ANL-W Staffing and Management

Human Infrastructure

- Effective recruitment, development and retention of staff are essential to success of R&D programs at INEEL and ANL-W
- ITF Report describes both Laboratories' current efforts
- ITF believes efforts could be improved through benchmarking against other organizations' practices

INEEL/ANL-W Interfaces

- Three major interface agreements in place
 - MoU between DOE-ID and DOE-CH (1997)
 - DOE Nuclear Reactor Technology Lead Lab Charter: ANL and INEEL (1999)
 - Programmatic Memo of Agreement between ANL-W and INEEL (2001)
- ITF stated (in Jan 03) that DOE needs to ensure that the resources of both laboratories are optimally used to carry out this R&D mission

New “Idaho National Laboratory”

- On April 30, 2003 DOE Secretary announced that the Idaho Laboratories would be renamed “Idaho National Laboratory”
- The Laboratory (managed by Office of NES&T) would be composed of INEEL and ANL-W and would specialize in developing advanced nuclear energy technologies

Idaho Environmental Cleanup

- Environmental cleanup scope (managed by Office of EM) will be separately bid
- Work will include the remediation of legacy wastes and disposition of surplus facilities

Laboratory and University Interfaces

NE R&D encompasses wide range of topics

- Advanced Fuel Cycle Initiative, Series 1 & 2
- Gen IV Roadmap
- NERI and INERI
- NASA space initiatives
- Naval reactor programs
- NE beyond 2010

INEEL as Lead NE Laboratory

- Leadership of this wide range of endeavors requires active and careful coordination with other DOE laboratories (whether of Office of Science or NNSA) and leading research universities
- ITF believes an INEEL external review process for laboratory activities would greatly assist in strategic planning and missions coordination

Additional Topics for Infrastructure Review-1

- Effectiveness of INEEL communications and working relationships with other DOE laboratories, private industries and universities.
- Strategic planning to establish focus and priorities for nuclear energy programs.
- Effectiveness of industrial health and radiation safety programs and integrated safety and security management.

Additional Topics for Infrastructure Review-2

- Effectiveness of quality management, quality assurance, performance indices, and self-assessment programs.
- Impact of INEEL and ANL-W (now INL) DOE contract negotiations on work force morale and productivity, particularly on projects with demanding time schedules.
- Effectiveness of management-craft labor relations.
- Effectiveness of community and public relation activities, including advocacy role for nuclear energy R&D.

Most Important Conclusions-1

- ITF believes it is significant and important to have designated a lead laboratory for nuclear energy research and development.
- The funding at the Idaho site, given the lead-lab status is clearly insufficient.
- ITF notes that there are certain facilities, e.g., the Fuel Processing Facility, that have lost their missions and/or for which significant maintenance challenges exist. These facilities should be abandoned.

Most Important Conclusions-2

- ITF observes that if Idaho site facilities are to be used for the proposed missions, e.g., Advanced Fuel Cycle Initiative, Generation IV Reactors and other nuclear energy programs beyond 2010, resources must be provided at appropriate levels

Most Important Recommendations-1

- Given events since the *National Energy Strategy* was issued, the ITF believes that the federal commitment to nuclear energy needs to be restated and reinforced by the White House and other senior administration officials
- For the Administration to go forward with “nuclear energy beyond 2010” the lead lab site at Idaho requires an immediate and significant increase in funding to, e.g., clear up maintenance backlog and make key facilities mission ready

Most Important Recommendations-2

- ITF recommends that university participation (faculty and students) be a basic element of research and development in “nuclear energy beyond 2010”
- Some facilities should be shut down or not considered for further development. In our view this includes the uncompleted Fuel Processing Facility (FPF) that we recommend be abandoned. There may be others such as the Flourinel Dissolution Process Cell (FDP)

Most Important Recommendations-3

- New facilities will probably be needed for the purposes of “nuclear energy beyond 2010”. We believe this might include a source of fast neutrons, among others. In this regard ITF recommends a specific study on the need for steady and transient fast neutron facilities in the U.S. This study should consider accessibility of existing support facilities.
- In order to optimize the use of resources we strongly recommend that use of facilities beyond the Idaho site but in the U.S. (e.g. ANL-E, Oak Ridge, and Savannah River) and international sites in the Gen IV partner countries.

Most Important Recommendations-4

- Given the designation of INEEL (now INL) as the lead nuclear energy laboratory, ITF recommends that INEEL (INL) establish an external review process for laboratory activities.